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We claim:

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1. An interlayer for placement on a road, comprising a mixture of:

aggregate; and

an asphalt binder, wherein said interlayer has a Hveem Stability at 60°C and 50 gyrations of at least about 18 and a Flexural Beam Fatigue of at least about 100,000 cycles at 2000 microstrains, 10 Hz, about 2-4% air voids, and at temperature of about 0 to 30°C.

2. The interlayer of claim 1, wherein about 100% of said aggregate is able to pass through about a 9.5 mm sieve.

3. The interlayer of claim 1, wherein said asphalt binder is a polymer modified asphalt binder.

4. The interlayer of claim 3, wherein said binder further comprises a cross-linking agent that has reacted with said polymer.

5. The interlayer of claim 4, wherein said asphalt is about 80-99% by weight of said binder, said polymer is about 1-20% by weight of said binder, and said cross-linking agent is about 0 to 2% by weight of said binder.

6. The interlayer of claim 1, wherein said binder further comprises an asphalt extender.

7. The interlayer of claim 1, wherein said interlayer is about 0.5 to 2 inches thick on said road.

8. The interlayer of claim 1, wherein said binder is chosen based on the climate.

9. The interlayer of claim 8, wherein said binder is chosen from a Type I binder for Northern climates, a Type II binder for Central climates, and a Type III binder for Southern climates.

10. The interlayer of claim 1, wherein a Type I binder is chosen so that the complex shear modulus divided by the sine of the phase angle of said binder is at least about 2.2 kPa on RTFO residue when measured at a temperature of at least 52°C, the creep stiffness of said binder at 60 seconds as measured on the BBR using PAV-aged residue is less than 300 MPa at a maximum of about -18°C, and said ductility at 4°C on RTFO residue at 5 cm/min strain rate is at least about 30 cm, when using straight-sided molds.

11. The interlayer of claim 1, wherein a Type II binder is chosen so that the complex shear modulus divided by the sine of the phase angle of said binder is at least about 2.2 kPa on RTFO residue when measured at a temperature of at least 58°C, the creep stiffness of said binder at 60 seconds as measured on the BBR using PAV-aged residue is less than 300 MPa at a maximum of about -12°C, and said ductility at 4°C on RTFO residue at 5 cm/min strain rate is at least about 20 cm, when using straight-sided molds.

12. The interlayer of claim 1, wherein a Type III binder is chosen so that the complex shear modulus divided by the sine of the phase angle of said binder is at least about 2.2 kPa on RTFO residue when measured at a temperature of at least 64°C, the creep stiffness of said binder at 60 seconds as measured on the BBR using PAV-aged residue is less than 300 MPa at a maximum of about -6°C, and said ductility at 4°C on RTFO residue at 5 cm/min strain rate is at least about 10 cm, when using straight-sided molds.

13. The interlayer of claim 12, wherein the rotational viscosity of said binder is less than about 3000 cPs at 135°C.

14. The interlayer of claim 1, wherein the rotational viscosity of said binder is less than about 2500 cPs at 135°C.

15. The interlayer of claim 1, wherein said interlayer has a maximum of about 2.5% air voids.

16. The interlayer of claim 1, wherein said interlayer has a VMA of at least about 16%.

17. The interlayer of claim 1, wherein said interlayer is substantially impermeable.

18. The interlayer of claim 1, wherein said interlayer is recyclable.

19. A method of making an interlayer on a roadway, comprising:

selecting an aggregate;

selecting an asphalt;

selecting a polymer;

heating said asphalt to between about 150 and 200°C;

adding said polymer to said asphalt to form a binder;

stirring said binder until said polymer is substantially dissolved;

stirring said binder until a substantially homogeneous binder is formed;

mixing said binder with said aggregate to form an interlayer; and

performing a stability test on said interlayer;

performing a fatigue test on said interlayer; and

spreading said interlayer on said roadway.

20. The method of claim 19, wherein said stability test is Hveem Stability test and wherein said mixture has a Hveem Stability at 60°C and 50 gyrations of at least about 18.

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21. The method of claim 19, wherein said fatigue test is a Flexural Beam Fatigue Test and said mixture has a Flexural Beam Fatigue of at least about 100,000 cycles at 2000 microstrains, 10 Hz, about 2-4% air voids, and at temperature of about 0 to 30°C.

22. The method of claim 19, further comprising:

adding a cross-linking agent to effect vulcanization of said binder.

23. The method of claim 19, wherein said polymer is added to said asphalt under low shear blending conditions.

24. The method of claim 19, further comprising:

determining the shear modulus, strain tolerance, and the bending creep stiffness of the binder.

25. The method of claim 19, further comprising:

determining the rotational viscosity of the binder.

26. A method of reconstructing a roadway comprised of an interlayer and an overlay, said method comprising:

selecting an aggregate;

selecting an asphalt;

selecting a polymer;

heating said asphalt to between about 150 and 200°C;

adding said polymer to said asphalt to form a binder;

stirring said binder until said polymer is substantially dissolved;

stirring said binder until a substantially homogeneous binder is formed;

mixing said binder with said aggregate to form an interlayer;

performing a stability test on said interlayer;

performing a fatigue test on said interlayer;

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spreading said interlayer on said roadway.

determining a desired thickness of said overlay based on traffic levels; and

applying said overlay to said interlayer in said desired thickness.

27. The method of claim 26, wherein said interlayer is cooled to below about 140°F before applying said overlay.

28. The method of claim 26, wherein said roadway is comprised of Portland Concrete Cement.

29. The method of claim 26, further comprising:

sweeping said roadway; and

sealing cracks in said roadway before applying said interlayer.

30. The method of claim 26, wherein said overlay is at least about 1 inch thick.

31. The method of claim 26, further comprising:

allowing traffic to drive on said interlayer before applying said overlay.

32. The method of claim 26, wherein said overlay is comprised of hot mix asphalt.

33. The method of claim 32, wherein overlay is further comprised of a SB/SBS polymer modified asphalt binder.

34. The method of claim 19, further comprising:

performing volumetric testing on said interlayer after mixing said binder with said aggregate to form and interlayer.

35. The method of claim 26, further comprising:

performing volumetric testing on said interlayer.

36. The method of claim 26, wherein said interlayer is cooled to below about 140°F before releasing said interlayer to traffic.